Installing the GS/OS Driver

For best performance and versatility it is recommended to install the *Micro*Drive's GS/OS driver on your System volume (the floppy disk or the hard disk partition you boot from). If you don't install the driver, your *Micro*Drive Card won't give you the fastest speed you could expect. However, the card also works fine with no GS/OS driver installed.

To install the GS/OS driver, just use any file copy utility and copy the driver from the utilities disk to your

/my.disk/SYSTEM/DRIVERS/

folder. "my.disk" is the place holder for the name of your boot volume. This can be an Apple system disk, your hard disk, or a RAM disk. If you are planning to use more that one volume as a bootable system volume, please be sure to copy the driver into every SYSTEM/DRIVERS/ folder. The driver's functions are available after the next reboot of a GS/OS system volume. You also can use the INSTALLER to install the driver a bit more conveniently. For this purpose, a copy of the INSTALLER (present on the GS/OS system disk /INSTALL). should be launched from the *Micro*Drive utilities disk.

Please note that a GS/OS driver is never available under ProDOS 8 operation (in fact this is why it is called GS/OS driver). The driver is active only as long as GS/OS is active. If you launch a ProDOS 8 application, the driver "sleeps" until you return to GS/OS operation. This is true for any block device driver under GS/OS, this is not a fault or a special feature of the *Micro*Drive Card driver.

Miscellaneous

☐ Using Two Hard Drives

In the world of AT clones (as it is with the IDE drives connected to the *Micro*Drive Card) you can have two drives connected to an IDE interface. drive one is called the MASTER drive, and drive two is also called the SLAVE drive. The master/slave condition is determined by the hard disk's jumper setting. There is no difference in connecting the hard disk to the IDE interface - same cable, same plug.

☐ Setting the hard drives' jumpers

In a one-drive configuration your drive should be jumpered as MASTER, and NO SLAVE PRESENT.

In a two-drive configuration: the first drive should be configured as MASTER (with jumper SLAVE PRESENT set). The second drive should be jumpered as SLAVE. In some cases you need to set additional jumpers as HOST SLAVE PRESENT or drive SLAVE PRESENT. Be sure to power up both drives at the same time. Please be sure to get a data sheet for the drives you are using, otherwise you will be·lost if you don't know how to jumper your drives.

☐ IDE Cable

The IDE cable must not be longer than 3 (three) foot. The IDE standard dictates this restriction. Do not fold the cable to get a "U" (regarding the cross section). Otherwise the signals cannot be transferred properly over the lines. A second drive must not be located more than about 4 (four) inches from the first IDE hard disk connector.

☐ Booting from a different volume

Using the *Micro*Drive Card, you can choose any volume for the boot volume. Just hold down the Open Apple Key or the Option Key at boot time. At the bottom of the screen you can see a message which tells you how many volumes you have. Now press any number "1" through "9" and "A" through "G" for the corresponding volumes 1...16. Be aware that you must have a bootable operating system on the desired boot volume. At any time, when no key is pressed, rebooting will use the default boot volume as specified in the utility program.

The default Boot Volume can be stored on both drives with different values. The boot volume parameter only takes effect when coming from drive number one. This is for reason of compatibility in the case you want to exchange the drives (yes, you can do that with no problems) or you once prefer to use only one drive (this could also be your second drive). Be aware that although you can boot from a partition on drive two, the operating parameters from drive one will be used.

☐ Software Compatibility

Some programs (especially copy protected games and programs that will not run from the Finder or require their own boot process) are not aware of the Apple IIGS Memory Manager and therefore will not run from hard disk because the *Micro*Drive Card requests memory from the Memory Manager. When the memory is overwritten by those programs, the *Micro*Drive Card software will crash (examples: The Immortal, PHOTONIX). We do not feel responsible for such a situation. Please complain at the people who did not want to write Apple IIGS software that adheres to the standards published by Apple Computer.

If you can find a program that doesn't work with the *Micro*Drive Card and it proves to be OK with Apple's guidelines, you will receive a free update on any software or firmware part of the *Micro*Drive Card that requires updating.

☐ Using the Macintosh HFS File System

You may have noticed that the *Micro*Drive Card does not allow partitions greater than 32MB. This is the upper limit for the ProDOS File System. The size is limited by the *Micro*Drive Card software, and this will remain as it is in the future. The only reason to open the 32 MB limit would be using HFS partitions. There are several important reasons which should keep you back from using the HFS File System for regular hard disk usage:

1) The HFS partitions don't give you any other advantages but the larger size.

2) Due to GS/OS design limitations, you never can boot from HFS partitions.

3) If something goes wrong with a misbehaving program, and your HFS partition gets damaged, you don't have any chance to repair the directory structure (there aren't any utilities which can do that). The only choice you have is to re-format the damaged partition, with a complete loss of data.

4) Writing to a HFS partition is very slow, and such, any speed advantage has gone with using a hard disk (writing to a HFS volume is also slow when using diskettes and other storage media).

5) Using a HFS partition at read operations is not faster than using a partition with the ProDOS File System.

As a summary, we cannot recommend using the HFS feature at all. There are even reports that the HFS FST doesn't always work reliably. For the Apple IIGS, it's a nice feature when moving data between different computers, but not much more.

Using Your Vulcan or InnerDrive Hard Drive

This section is intended for Vulcan users and InnerDrive/OverDrive users (including other Applied Ingenuity hard drive products with IDE drives) who want to upgrade their system with the *Micro*Drive Card. If you have any IDE drive other than a Vulcan or InnerDrive you don't need to follow these instructions.

Back Up!

If you are planning to replace the Vulcan Controller Card or the InnerDrive Controller, first make a complete backup of your hard disk data! The partitioning scheme of the *Micro*Drive Card is not compatible with these drives. You will have to begin like just having purchased a new drive.

We cannot give you much recommendation about backup programs, but the cheapest way to make backups is to use the Archiver from GS/OS System 6. When you want to backup your data, you should be sure to make **file-by-file backups**. Only this kind of backup guarantees that you can restore your data on a different hard disk with different volume sizes (this will most likely occur).

Setting Up your hard disk

After you have made the necessary backups and the *Micro*Drive Card is connected to your Vulcan, you can run the program MICRO.INSTALLER on the *Micro*Drive Card Utilities Disk. Just go ahead as it is described in the section "Preparing your hard drive" in this manual. It is possible that you cannot follow these instructions because some old hard drives cannot be setup automatically. If you are getting error messages after the MICRO.INSTALLER has tried to find the hard drive's operating parameters, you must set the parameters yourself by using menu item <MANUAL SETUP>.

You must enter the **native hard disk parameters..** If you are not sure about what kind of hard disk your Vulcan or InnerDrive has built in, you will need to contact us. Please let us know the hard disk model you are using (manufacturer, model number and capacity) and we will try to find the correct operating parameters. In many cases you can use menu item GET HARD DISK INFO to find the correct parameters.

Troubleshooting

We have tested each card thoroughly before it went to our customers, so your card should work flawlessly. And we have tried to cover every aspect of the installation process here in this manual. Our records show that most problems are related to hard drives which have been configured incorrectly. A few problems occurred because some users didn't follow our hints in the manual. A few problems are remaining due to hidden firmware bugs on several old hard drives (note that the IDE "standard" is not a standard as you might expect, and several early IDE hard drives had serious problems).

We don't claim to be the perfect company, so in rare cases problems may occur which cannot be solved by the customer. Please check out if you have done your installation according to the guidelines found here in this manual. If we receive hardware to be repaired and we find it is OK, we'll have to charge you for checking out that it is OK.

So before you come up and complain that your new hardware doesn't work, please check out once again:

☐ Did you read this manual completely? Is there anything you didn't read at the first glance?

☐ Does your "third party hardware" (hard disk) work correctly? Check the drive in question in an MS-DOS computer if possible. Please double check the connections from the *Micro*Drive Card to your hard disk.

☐ Be sure to try out the manual setup (MICRO:INSTALLER program) if the automatic setup doesn't work or if the setup process gave you any strange impressions.

Describe as detailed as possible !

If your problems cannot be solved in this way and you don't know how to continue, please send us e-mail via GEnie or write via snail mail. Please do not send anything back to us without an RMA number. SHH Systeme will refuse to accept any shipment without RMA number.

Please describe your complete configuration (this is a very important thing, otherwise we cannot fix problems):

☐ Your *Micro*Drive Card's firmware revision and revision numbers from software on the utilities disk.

☐ Your computer: Apple IIe, Apple IIGS, which ROM # and the serial number printed on the motherboard (located at the upper right corner, beside slot 7).

☐ Any card which is installed in your Apple IIe or IIGS, slot number of each card, revision number and software revision number.

☐ The hard disk manufacturer and model number you are using.

☐ Apple IIGS Control Panel slot setup (internal/your card) for each slot.

☐ Give us exact information about what kind of memory expansion card you are using (revision number and serial number required).

☐ Describe the symptoms where the error occurs. What software did you use? Describe the steps in detail to duplicate the problem.

If you have any problems and you don't know how to get any further, send us e-mail or write via snail mail. Please do not send anything back to us without a RMA number.

Known Problems

At the time of this printing, the following hard drives were found being not fully compatible with the IDE Standard or having bugs in their own operating system firmware.
(this does not imply that all drives not mentioned here are OK)

Conner: CP30204: Universal translation mode does not work correctly, replaced by CP30254.
   CP30104, 105 Mbytes Version:Universal translation mode does not work correctly.
      The 120Mbyte version of this drive (CP30104) works fine.

Seagate: ST1144A: unable to read or write 256 sectors at a time. This is required for the *Micro*Drive Card, but not for any MS-DOS computer.

Western Digital: many older mechanisms that are also used in the early versions of the Vulcan hard drives. These drives do not support the IDENTIFY HARD DISK command. This command is not required for operation with the *Micro*Drive Card and the drive will work correctly. However due to poor performance of these old drives, we recommend using only Western Digital drives manufactured in 1994 or later.

In general you may encounter problems when using drives with a size of 2 Gigabytes or more because these drives do have bugs when using the CYL/HEAD/SECTOR mode (which is used with the MicroDrive cards).

Error Messages at Boot Time

To boot from the *Micro*Drive Card, the firmware must be able to access the first hard disk (master) connected to the card. Even if you want to boot from a volume on the second hard disk (Drive 2), the first hard disk must be powered up, must be configured as a master drive and must have a valid setup. The current operating parameters will always be the ones from the master drive (Drive 1), regardless of the volume number you may want to boot from.

If an error occurs during the very first part of the boot process, the *Micro*Drive Card informs you about the error by displaying one of the following error messages and gives you control over your computer at the Applesoft Basic prompt.

Drive 1 Error:

The *Micro*Drive Card cannot get access to the first hard disk. There are many reasons that may cause this error:

- there is no hard disk connected
- the hard disk is not powered up
- the hard disk is jumpered as a slave drive
- two hard disk are connected and both are set to a master drive
- the hard disk has a defect
- the first hard disk is not ready within 15 seconds after power up.

Missing configuration data

The *Micro*Drive Card cannot load a valid configuration from the first hard disk (master). A setup using the installation program MICRO.INSTALLER is required to create a valid configuration. Also, the sector on the hard disk containing the configuration data could be physically damaged..

Error reading boot sector

A read error occurred when trying to load the *Micro*Drive Card's private boot sector (not the ProDOS boot sector). This is because the boot sector is damaged (bad checksum) or has no valid code for the continuation of the boot process. This sector is always automatically written to the hard disk when writing a configuration file to the disk from where you started the configuration program (this feature can be used for a "refresh" if the boot sector has been destroyed occasionally).

Volume not formatted

The *Micro*Drive Card could load a configuration, but it could not find anything that looks like a PRODOS boot sector. This sector is usually present after a volume has been high-level formatted by a system utility like the Finder etc. Note that this error message is related to the volume you want to boot from.

Unable to load ProDOS

This message appears if the ProDOS boot routine (located on the boot sector of any PRODOS volume and loaded into the computer's memory at boot time) has found one of the following errors:

- the boot routine cannot find a directory structure on the boot volume (directory may be damaged)
- the boot routine cannot find a file with the name PRODOS in the root directory of the current boot volume. The file PRODOS usually is the PRODOS 8 operating system or the file that launches GS/OS.
- while loading PRODOS, a read error occurs because of a bad sector belonging to the file PRODOS.

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*Micro*Drive Card   -- 16 --   © 1995 ///SHH Systeme

Warranty Registration

Please fill out this warranty registration. You must return the completed form or we cannot give you warranty support or regular service.

| Purchaser |

Name   :
Address   :
City   :
State, Zip   :

| Vendor |

Company/Name   :
Address   :
City   :
State, Zip   :

| Product |

Name   :
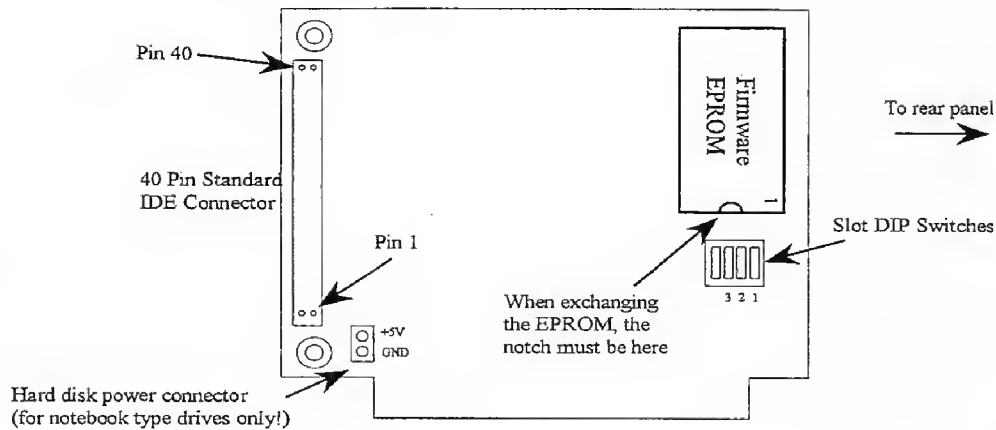Date of purchase :
Serial number   :

| Misc. Infos |

Computer type   :

Other cards installed,   :
slot number of each
card   :

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comments, wishes,
suggestions,
improvements,
bugs found

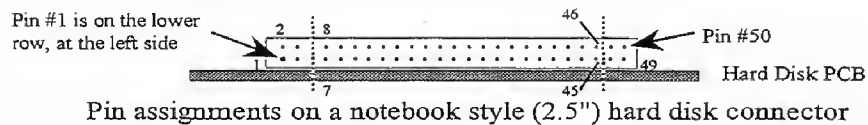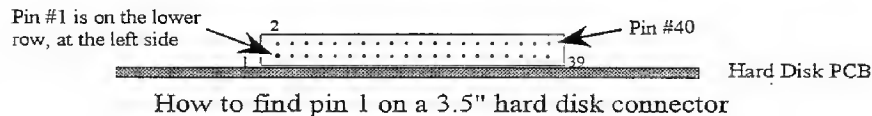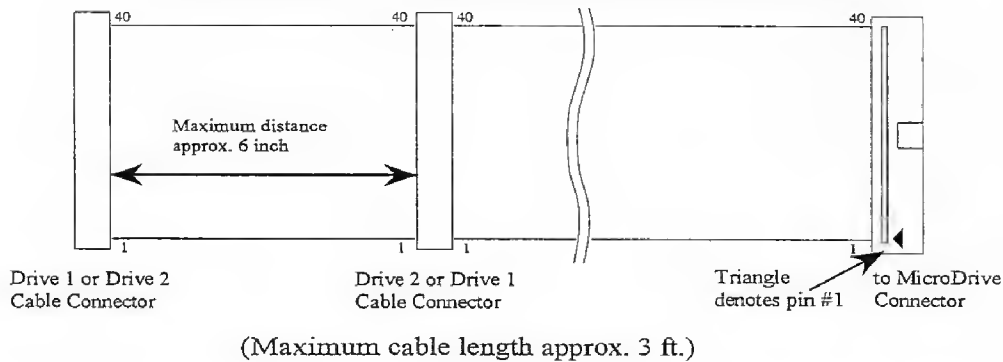Please send this registration form to: ///SHH Systeme
                                            Dipl. Ing. Joachim Lange
                                            Bergstrasse 95
                                            82131 Stockdorf
                                            Germany

*Micro*Drive Card

Pin 40

40 Pin Standard
IDE Connector

Pin 1

Firmware EPROM

To rear panel

Slot DIP Switches

3 2 1

When exchanging
the EPROM, the
notch must be here

+5V
GND

Hard disk power connector
(for notebook type drives only!)

Cable configuration required when using external hard drives

40   40 40   40

Maximum distance
approx. 6 inch

Drive 1 or Drive 2   Drive 2 or Drive 1   Triangle   to MicroDrive
Cable Connector   Cable Connector   denotes pin #1   Connector

(Maximum cable length approx. 3 ft.)

Pin #1 is on the lower
row, at the left side

2   Pin #40

1   39

Hard Disk PCB

How to find pin 1 on a 3.5" hard disk connector

Pin #1 is on the lower
row, at the left side

2   8   46

Pin #50

49

1   45

Hard Disk PCB

7   45

Pin assignments on a notebook style (2.5") hard disk connector

For use with any IDE controller, pin 7,8 to 45,46 corresponds to pin 1,2 to 39,40 on a standard 40-pin
IDE connector (used on the MicroDrive Card as well as on the Turbo IDE Card). Pins 47, 48, 49, 50
are reserved for power supply purposes. Do not try to build your own power supply cable!